

REMARKS

Applicants appreciate the thorough examination of the present application, as evidenced by the Office Action mailed November 27, 2007. Applicants further appreciate the courtesy extended by the Examiner in the interview of January 3, 2007 between the Examiner and the undersigned attorney. In the present paper, Applicants have presented extensive claim amendments that clarify certain differences between the claims and the cited references. In addition, Applicants have presented new Claims 11-18, which Applicants submit are patentable over the cited references for at least the reasons explained below. Favorable reconsideration of the application is requested in view of the amendments.

1. The Objection to Claim 9 Has Been Overcome

The Office Action objected to Claim 9 due to the recitation of "access the longitudinal position measurement." Claim 9 has been amended to recite "a target head able to access the target destination but not able to access a source location; wherein the source head is able to access the source location but is not able to access the target destination." Accordingly, Applicants respectfully submit that the objection has been rendered moot, and request that the objection to Claim 9 be withdrawn.

2. Claims 1-7 Are Patentable Over The Cited References

Claims 1-4, 6 and 7 stand rejected under 35 USC 102(b) as anticipated by U.S. Patent No. 5,570,332 to Heath et al. ("Heath"). Claim 1, as amended, recites as follows:

1. A method comprising a step (a) of selecting a target destination from among first and second target destinations using at least two adjusted seek lengths including a first adjusted seek length for the first target destination and a second adjusted seek length for the second target destination, wherein each of the first and second adjusted seek lengths are adjusted using respective lateral offset indicators derived from a longitudinal position measurement of a source head at a source location.

According to Claim 1, a target destination is selected from among first and second target destinations based on adjusted seek lengths for the first and second target destinations. The first and second target destinations can refer, for example, to target locations on a disc

stack associated with first and second disc access commands received by the disc drive. See Specification, p. 14, lines 6-23.

The seek lengths are adjusted using respective lateral offset indicators. That is, rather than using the raw seek lengths (i.e. the difference between a source cylinder and the target cylinder) as a basis for selecting a disc access command for execution, the seek lengths are first adjusted by respective lateral offset indicators. As explained in the Specification, adjusting the seek lengths using lateral offset indicators can provide more accurate seek length estimates, particularly when the destination head is different from the source head, because the source and destination heads can be laterally offset from one another by a significant distance. As noted in the Specification, a track center offset can be one to three orders of magnitude greater than a nominal track pitch. Specification, page 10, lines 17-19.

According to Claim 1, the lateral offset indicator for a particular disc access command can be determined as a function of the longitudinal position of the source head at the source location. That is, the adjustment of a particular seek length can be calculated based on the longitudinal position of the source head, which in the case of a rotating disc refers to the rotational position of the disc relative to the source head. As is well known, the rotational position of a disc relative to a read/write head can be provided by the sector number of the sector over which the head is located.

While Heath discloses a method of sorting disc access commands in a command queue, see Heath, col. 4, lines 26-28, Heath does not adjust the seek lengths, much less adjust the seek lengths using lateral offset indicators derived from a longitudinal position measurement of a source head, or use adjusted seek lengths in the selection of a command for execution. Rather, Heath describes a method that takes both the raw (i.e., unadjusted) seek length as well as the rotational latency of the seek into account in determining an order of command execution. As stated in Heath:

The method substantially minimizes command access time for a system by identifying a command from the command queue array which addresses a location within a region having the smallest rotational latency from the current position of the read/write element 12 and within seek range 16. If the method fails to find a command in the command queue which addresses a location within seek range 16, seek range 16 is iteratively expanded by the number of cylinders which can be additionally traversed by read/write element 12 during an additional revolution of disc 10. Seek range 16 is iteratively expanded until a command addressing a location within the current seek

range is identified and executed. FIGS. 2 and 3 illustrate the method of the present invention.

Heath, col. 4, lines 28-41. While the seek range of Heath depends on the rotational position of the disk, the seek lengths used by Heath are simply taken as the distance from the source cylinder to the destination cylinder for a particular disc access command. As stated in Heath at col. 8, lines 52-58, the cylinder delta (i.e., the seek distance, or seek length) "is the number of cylinders from the current position of the read/write element to the start cylinder of command queue (index)."

Accordingly Heath does not teach or suggest "selecting a target destination from among first and second target destinations using at least two adjusted seek lengths including a first adjusted seek length for the first target destination and a second adjusted seek length for the second target destination," as recited in Claim 1, nor does Heath teach or suggest that "each of the first and second adjusted seek lengths are adjusted using respective lateral offset indicators," or that such lateral offset indicators can be "derived from a longitudinal position measurement of a source head at a source location," as recited in Claim 1. Claim 1 is therefore not anticipated by Heath, and the rejection of Claim 1 should be withdrawn.

Claims 2-7 are patentable at least per the patentability of Claim 1.

3. Claims 8-10 Are Patentable Over The Cited References

Claims 8-10 stand rejected as anticipated by Heath. Claim 8, as amended, recites as follows:

8. An apparatus including:

a disc stack having at least one rotatable data storage disc including at least two data storage surfaces; and

a controller configured to select a target destination on one of the data storage surfaces from among first and second target destinations using at least two adjusted seek lengths including a first adjusted seek length for the first target destination and a second adjusted seek length for the second target destination, wherein each of the first and second adjusted seek lengths are generated in response to a corresponding lateral offset indicator derived from a longitudinal position measurement of a source head.

Claim 8 is patentable for similar reasons as explained above with respect to Claim 1. In particular, as explained above, Heath does not teach or suggest adjusting a seek length of a seek, much less a controller configured to adjust a seek length and to select a target destination based on an adjusted seek length. The rejection of Claim 8 as anticipated by Heath should therefore be withdrawn. Claims 9-10 are patentable at least per the patentability of Claim 8.

4. New Claims 11-18 Are Patentable Over The Cited References

New Claim 11 recites as follows:

11. A method comprising:

adjusting estimates of a seek lengths for queued disc access commands to compensate for lateral offset present between a source head that performed a previously executed disc access command and target heads that will perform the queued disc access commands.

Applicants respectfully submit that the recitations of Claim 11 are not taught or suggested by the cited references, and that Claim 11 is therefore patentable over the cited references. Claims 12-18 are patentable at least per the patentability of Claim 11. In addition, many of these claims provide additional bases for patentability. For example, Claim 12 recites as follows (emphasis added):

12. (New) The method of Claim 11, further comprising:

receiving first and second disc access commands, the first and second disc access commands identifying respective first and second target locations on the disc, each target location including a target cylinder, a target head and a target sector; and

generating a first preliminary seek length for the first disc access command in response to a source cylinder and the target cylinder of the first disc access command, and generating a second preliminary seek length for the second disc access command in response to the source cylinder and the target cylinder of the second disc access command;

wherein adjusting the estimates of the seek lengths comprises:

generating a first seek length adjustment for the first disc access command in response to the source sector, the source head and the target head of the first disc access command, and generating a second seek length adjustment for the second disc access

command in response to the source sector, the source head and the target head of the second disc access command; and

generating first and second adjusted seek lengths in response to the first and second preliminary seek lengths and the first and second seek length adjustments.

Applicants respectfully submit that at least the underlined recitations of Claim 12 are not taught or suggested by the cited references.

5. Interview Summary

On January 3, 2008, Applicants' representative, David C. Hall, and Examiner Tsai discussed the status of the above-referenced application by telephone. The Examiner and the Applicants' representative discussed the disclosure of U.S. Patent No. 5,570,332 to Heath et al. as well as the amendments shown above to Claims 1 and 8, copies of which were provided to the Examiner. No agreement was reached.

Applicants respectfully submit that the above remarks constitute an Interview Summary pursuant to MPEP §713.04.

CONCLUSION

In light of the above remarks, Applicant respectfully submits that the above-entitled application is now in condition for allowance. Favorable reconsideration of this application, as amended, is respectfully requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (919) 854-1400.

Respectfully submitted,



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